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ABSTRACT

Described is a project that seeks to develop a new instructional approach that meets the needs of potential highschool dropouts with learning disorders in an attempt to help them acquire necessary levels of competence in the areas of English, mathematics, and science. The project is based on the Elementary and Secondary Education Act Title III. The project used a multi-sensory approach to learning disabilities which is said to be based upon the General Model of Instruction and upon an Instructional Management Strategy, both of which are explained. Program source guides are explained to contain the basic information that the student is required to learn and are said to take the following form: instructional objective, proficiency pretests, learning activities, self tests, formative evaluation, and questing. Then discussed are the role and responsibilities of the project teacher. Included are sample project forms. Explained are the reading, English, science, and mathematics programs. Information generally provided includes preliminary information, scope and sequence, and responsibilities of the teacher. The evaluation procedure to be followed is clarified. (CB)

INDIVIDUALIZED MULTI-SENSORY APPROACH to LEARNING

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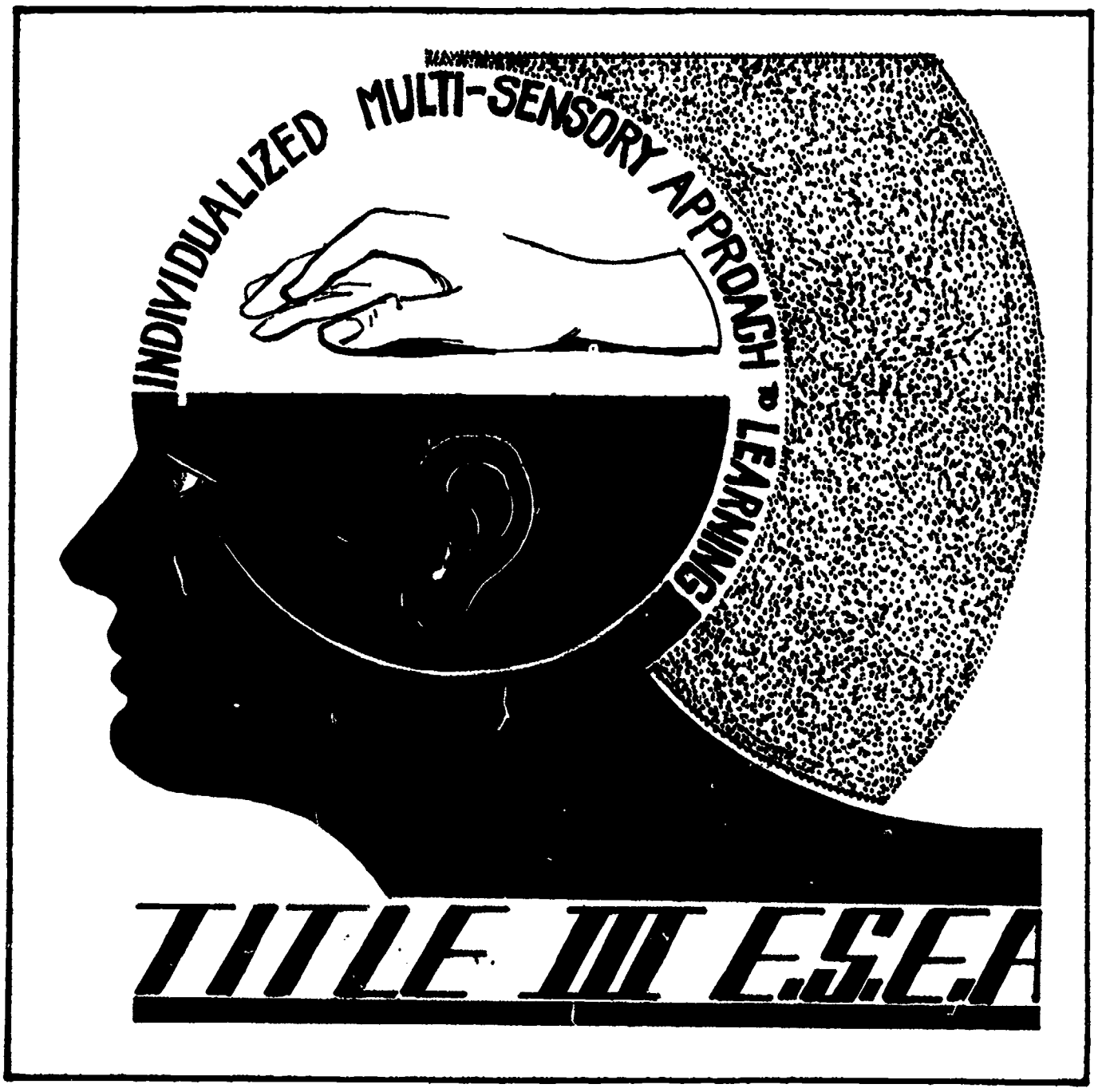
TITLE III E. S. E. A. PROJECT



PROGRAM SURVEY

LINCOLN COMMUNITY HIGH SCHOOL
LINCOLN, ILLINOIS

Dr. Robert W. Jones, Superintendent
John Landis, Project Director

A

Multi-Sensory Approach

to

Learning Disabilities

A Title III, ESEA Project

Program Survey

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Project Abstract

In each new freshman class at Lincoln Community High School, a large percentage of the students fail required academic courses in English, mathematics, and science. Their school failures appear to be associated with a low degree of skill in reading and a consequent inability to learn by reading from textbook assignments. Their skill in reading remains poor even when provided with remedial reading assistance and by the junior year, as a group, they score at the fourth grade level on standardized measures of reading achievement. Discouraged by continued failures and by their inability to read, these students become educational or school dropouts.

These students are of low average academic ability, but have normal vision, auditory, and motor abilities, and present adequate social and emotional adjustments. In brief, these students fit the operational definition of children with learning disabilities:

> Children with special learning disabilities exhibit a disorder in one or more of the basic psychological processes involved in understanding or in using spoken or written language. These may be manifested in disorders of listening, thinking, talking, reading, writing, spelling, or arithmetic. They include conditions which have been referred to as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, developmental aphasia, etc. They do <u>not</u> include learning problems which are due primarily to visual, hearing, or motor handicaps, to mental retardation, emotional disturbances or to environmental disadvantage.

Although considerable emphasis has been given in recent years to programs for learning disability pupils in the elementary school, very little effort has been expended in the development of innovative programs for students with learning disabilities at the secondary school level. Consequently, a new instructional program for students

with learning disabilities is needed at the secondary school level if these students are to acquire the basic skills necessary for successful independent living.

This project seeks to develop a new instructional approach that meets the needs of those students with learning disorders in order to enable them to acquire necessary levels of competence in the areas of English, mathematics, and science. Success in meeting these requisite courses may encourage these students to continue their school program and to complete a curricular series in some vocationally relevant area.

Statement of Educational Need

As is the case with many other secondary schools today, Lincoln Community High School has a "dropout" problem. Establishment of an area vocational center, a special education program for EMH students, and the construction of a new instructional materials center represent local efforts to meet individual needs more adequately. These expanded local efforts to provide complete instructional programming for a wide variety of individual student needs have resolved certain of those problems that prompted the student to drop out of school. However, the problem of the potential high school dropout with a learning disability remains unchanged. The provision of an instructional program and sequence that meets the highly individualized needs of students with learning disabilities is a high local priority.

The core of the dropout problem at Lincoln Community High School appears to reside with a particular group of students who fail required academic courses in English, mathematics, and science. The necessity to repeat failed academic courses initiates at the outset of their high school years a pattern of frustration and failure that precludes adequate social and educational adjustment.

The students who fail required academic courses in English, mathematics, and science are of low average academic ability, have normal visual, auditory, and motor abilities, and present adequate social and emotional adjustments. Thus, these students fit the operational definition of students with learning disabilities.

While the project is identified as a special education project designed to provide a new instructional approach for students with learning disabilities, the project is also in line with the non-special education needs assessment report in that it is aimed at an instructional program for potential school dropouts.

In the Report of Title III, ESEA: Needs Assessment, the need for programs for potential dropouts was identified as one of eleven significant educational needs. The magnitude of the need for programs for potential dropouts was dramatized by the fact that the State of Illinois and Unit Districts needs assessment rated the need for such a program as their first priority. The figures were 72.7% and 74.7% respectively. The Secondary School Districts needs response percentages rated the need for programs for potential dropouts as their second priority at 79.5%. Chicago needs response percentages also rated the need for such a program as their second priority at 78.5%.

Programs for potential dropouts ranked first in the identification of educational needs for the State for six geographical regions. In Region 4 (including Logan County), secondary school districts rated the need for programs for potential dropouts as the primary educational need. In the ranking of educational needs for respondent types within unit districts subsample, the need for programs for potential dropouts was rated number one out of the eleven identified program needs.

In the ranking of educational needs for urban versus rural districts, the need for programs for potential dropouts rated second in rural districts with a total population under 25,000, but was rated first in the total state ranking.

A

Multi-Sensory Approach to Learning Disabilities

Program Background

A total assessment of the relationships that exist among learning disabilities, school achievement, and the potential school dropout problem prompted the administrative and instructional staff at the Lincoln Community High School to consider two significant problems:

(1) How to identify and to use curriculum goals and instructional materials that are relevant to the needs of the student who manifests the characteristics of the disabled learner; and

(2) How to modify the instructional program so that the appropriate content and skills of English, mathematics, and science can be learned at a level, a rate, and by a multi-sensory modality adjusted to the needs of the particular student's learning disability.

These two problems led the administrative and instructional staff to the conclusion that any program designed specifically to help the disabled learner should:

(1) provide adequate background preparation of teachers in order for the teachers to understand the highly individualized needs of the student with learning deficits;

(2) provide immediate feedback to the student concerning the adequacy of his response to stimuli;

(3) provide a systematic procedure for plotting progress and for spotting difficulties or impediments to learning;

(4) provide opportunities for each student to operate at his own rate of learning;

(5) provide the means for the student to operate at his rate of learning;

(6) provide a self-directive program that requires little or no direct teacher supervision; and

(7) provide the services of a full-time psycho-educational diagnostician to work as a resource person with both students and teachers in order to prescribe appropriate multi-sensory stimulation for students.

Accordingly, the primary objective of the Title III program is to present the content of English, mathematics, and science to the learning disabled student through a variety of audio, visual, and kinesthetic instructional modalities. Such an instructional program should ameliorate the failure and the frustration that result when such students are unable to gain knowledge and skills through the reading of content area textbooks. Specifically, the program includes:

a) a restructuring of the curriculum so that the needs of each learner provide the rationale for the curriculum in that the highly individualized content achievement needs of the disabled learner provide the operational structure of the content curriculum;

b) an attempt at improving communication patterns in that the traditional formalized teacher-student communication pattern in which the teacher works directly with the disabled student in the determination of the learning and instructional modality that will facilitate and maximize individualized learning;

c) an attempt at modifying teacher behavior so that the teacher becomes a resource person who assists each child in becoming an active learner rather than a passive listener in that one of the primary functions of the teacher is to re-write course content in terms of behavioral objectives and to identify and to prepare appropriate audio, visual, and kinesthetic aids and materials that will facilitate the independent acquisition of content knowledge;

d) a specific attempt at restructuring the school program so that individual differences are dealt with in that the traditional rigidity found in the content areas that has impeded the amelioration of learning disabilities are restructured in terms of learning units that are designed to provide specifically for the individual needs of the disabled learner;

e) a concentrated and specific attempt at improving pupil motivation towards learning and attitudes toward the school in that a major cause of lack of motivation (repeated failure in content courses) will be ameliorated by removing disabled learners from a structure that promotes failure and frustration and by providing them with a structure designed to create a favorable attitude toward learning in the content fields and towards school in general.

Curriculum Base

The Multi-Sensory Approach to Learning Disabilities program is based upon the General Model of Instruction (GMI) and upon an Instructional Management Strategy (IMS) similar to that identified in the principles of Program Evaluation and Review Techniques (PERT).

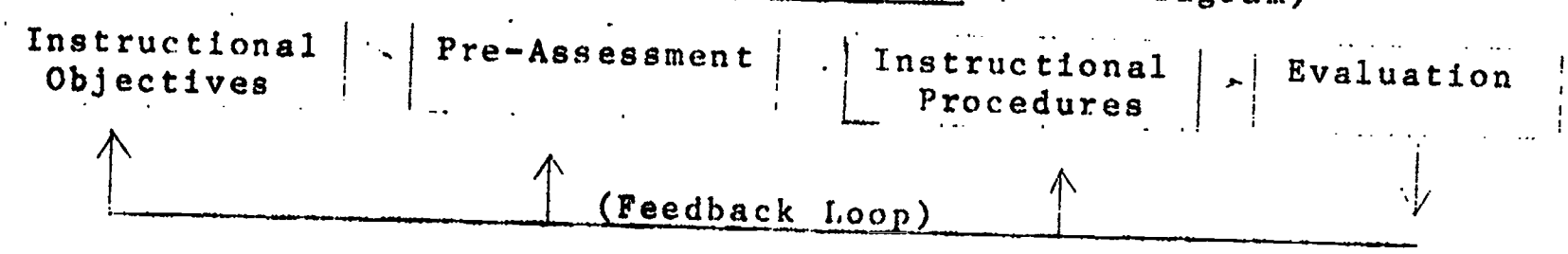
I. The General Model of Instruction (GMI)

The GMI is a procedural guide for designing and conducting instruction. The major philosophical assumption of the GMI is that the goal of instruction is to maximize the efficiency with which all students achieve specified objectives. The model is based upon a technology of instruction which has developed in the past several years from research and development work in three areas--experimental psychology, military training, and programmed instruction. The three individuals who have contributed most to the specific model presented for consideration are Gagné, Glaser, and Popham.

The two major functions of the model are: (1) to guide instructional designers and teachers through the major steps in designing and carrying out instruction; and (2) to provide an overall structure with which to view and to study the instructional process.

FIGURE 1

THE GENERAL MODEL OF INSTRUCTION (Flow Diagram)



Explanation of Figure 1: The General Model of Instruction

Instructional Objectives

1. Selection of appropriate objectives

   a. What the students are able to do before beginning the unit;

   b. What the students should be able to do in instructional units that follow the unit of concern, and what they should be able to do after completing their education; and

   c. The available instructional resources, including the instructor's capabilities with his subject matter.

2. Classification

   Taxonomies are significant in making sure that the objectives selected are of the type or level actually desired by the instructor.

3. Analysis

   Once a set of objectives has been selected, the instructor should perform a behavioral analysis in which he determines what the student will be expected to do to demonstrate achievement of that objective. A list of instructional objectives should be defined which clearly and completely prescribe the behaviors students are to acquire as a result of completing the instruction.

4. Specification

   Behavioral objectives will be most valuable if they contain the three elements outlined by Mager (Preparing Instructional Objectives, 1962).

a). A description of the type of observable behavior which the student will be asked to employ in demonstrating mastery of the objective (e.g., to write, to solve, to identify, etc.)

b). A description of the important conditions under which the student will be expected to demonstrate achievement of the objective (e.g., special instructions, time limits, available materials or equipment, etc.)

c). The criterion which will be used to evaluate the success of the student's performance (e.g., 70% correct, identify 8/10, etc.)

Pre-Assessment

Prior to beginning a unit of instruction, it is desirable to assess students to determine: (1) how much of what is to be learned in the unit they already know; (2) whether they have the necessary behavioral capabilities for the instruction to follow; and (3) the instructional activities that should be prescribed for each student. Pre-assessment should be based on the specific instructional objectives specified for the unit.

Instructional Procedures

After students are pre-assessed and adjustments are made, the instructional procedures are implemented. The design of the instructional procedures involves: (1) selection of available instructional materials (e.g., books, films, filmstrips, etc.); (2) preparing new instructional materials when necessary; and (3) developing a sequential plan which appears to be the most efficient for achieving the stated objectives.

Evaluation

When students complete an instructional unit, they are evaluated to determine whether the instruction was successful in achieving the unit's objectives. Important factors to be noted with respect to evaluation include: (1) It is the success of the instruction which is being evaluated; (2) Unsuccessful instruction is probably due to one or more of the following: (a) students did not have the prerequisites necessary to begin the unit; (b) the students were inadequately motivated before or during the unit; or (c) the instructional activities were inadequately designed; and (3) changes in objectives, pre-assessments, and instructional activities should be made, if necessary, so that all students achieve all required objectives.

II. The Instructional Management Strategy (IMS)

The Instructional Management Strategy (IMS) is based upon the principles of Program Evaluation and Review Techniques (PERT). The IMS is developed within the context of four phases of instruction advocated by Bush, Allen, and Trump. These four phases include large-group instruction, small-group instruction, laboratory instruction, and independent study.

Several assumptions underlie the Instructional Management Strategy. They include:

(1) The student's responsibility is to learn and the teacher's responsibility is to make available to the student that which is to be learned.

(2) The subject matter of a course must be appropriate to the learner with reference to: (a) the pace of instruction; (b) the level of difficulty of the instructional material; (c) the relevance of the instructional material to reality as perceived by the student; (d) the student's level of interest; and (e) the individual learning style of the student.

(3) The size of a group, the composition of a group, and the time allotted to a group should be appropriate to the purposes of the group.

(4) Before individual instruction can become a reality, learning packages are needed which provide for self-paced rather than group-paced instruction.

The strategy is designed to facilitate the individualization of instruction. One key to the strategy in providing for individualized instruction is the preparation of individualized learning units or packages.

Individualized instructional packages usually include the following elements for individualizing instruction:

1). Instructional objectives.

2). Multi-dimensional learning materials.

3). Diversified learning activities.

4). Pre-evaluation.

5). Self-evaluation.

6). Post-evaluation.

7). Questing.

The new instructional program designed for students with learning disabilities represents a synthesis of selected elements of the GMI and the IMS. Further, additional programs and instructional dimensions have been introduced to provide the flexibility necessary for local student educational needs. Specifically, the core of the instructional program utilizes the principles of the GMI and the IMS to facilitate multi-sensory learning through the preparation of individualized learning packages or Source Guides, as they are identified in the program.

Program Source Guides

The source guides contain the basic information that the student is required to learn. The source guide takes the place of a textbook for the student. Textbooks are used only as they should be used; that is, as resources that can assist the student in mastering the material to be learned. Each source guide should follow a prescribed format. Such unity of format will enable the student to move from one instructional area to another with the same set of "ground rules."

Accordingly, a source guide for a specific behavioral objective should take the following form:

1. Instructional Objective

The instructional objective tells the student what he will have to do to be able to do when he is evaluated, the important conditions under which he will have to perform and the lower limit or quality of performance expected of him. Instructional objectives, then, constitute the backbone of the source guide.

2. Proficiency Pre-tests

Proficiency pre-tests are designed to identify the extent to which the student has already achieved the instructional objectives as a result of his earlier learning experiences. Pre-evaluation is formative and diagnostic in nature; that is, such evaluation re-directs subsequent learning experiences. Pre-evaluation instruments should be matched to the instructional objective.

3. Learning Activities

Learning activities are designed to provide the student with the experiences necessary for mastering the stated objective. Learning activities must be carefully matched to the objective if they are to be worthwhile and to avoid the stigma of "busywork." Learning activities should be designed that include as wide a variety of sensory activities as possible.

A variety of instructional modes should be made available to the student. It may be determined that student A is primarily an auditory learner; i.e., his learning is facilitated through auditory channels. If this should be the case, then mediated instruction should be auditory in nature. The focus of any seminars should be on auditory learning, and so on. Students should not, in all probability, be restricted to only one instructional modality. They should have the opportunity to learn in a variety of instructional modes. The important consideration to keep in mind is that the instructional modality should be matched to the student's learning modality.

It may be that until media can be developed that the dominant instructional modality will be that of the conventional class. Hopefully, as both students and teachers adjust to a different way of learning and teaching, other modalities will replace the conventional class as the dominant instructional mode. Students must have the option of obtaining the same information through as many different senses as possible.

Additionally, the planning of diversified learning activities should provide for alternative approaches for achieving the same instructional objective. Such diversified learning activities might include large group and small group instruction, field trips, model building, drama productions, games, laboratory experiments, etc.

4. Self-Testing (Student)

Self-testing is designed to assist the student in determining his individual progress toward achieving the stated instructional objective. Self-evaluation occurs after the student has completed the learning activities and prior to the time he is ready for the formative evaluation by the teacher. Self-testing is also formative in nature since it serves to re-direct the student's learning efforts.

5. Formative Evaluation (Teacher)

Formative evaluation is designed to assess the extent to which the student has achieved the stated instructional objective as a result of his learning experiences. This evaluation is summative for the student who is successful; that is, the objective has been met if the student passes the evaluation at the prescribed level. The evaluation is formative, however, for the student who fails to complete the evaluation at the prescribed level. When this occurs, the classroom teacher must identify precisely where the learning sequence for this particular student broke down, and then re-direct the student's learning

through revised learning activities. It is at this stage that the teacher serves as both diagnostician and tutor. The teacher must determine if the instructional modality was ill-matched to the student, and determine also what learning activities will facilitate the student's eventual mastery of the instructional objective.

6. Questing

Questing is a student-initiated and self-directed learning activity. Questing, in this sense, is enriching in nature. It is optional for the individual student. Completing quests indicates a degree of interest on the part of the student that is over-and-above minimal requirements. Questing represents a horizontal rather than a vertical enrichment of the curriculum. The student is permitted to expand his understanding in related areas of interest by going into greater depth than would normally be the case. This type of horizontal enrichment is superior to vertical enrichment where the student is simply given additional work in the same restrictive area. Essentially, horizontal enrichment is qualitative in nature, while vertical enrichment is quantitative.

Questing depends largely upon student interests. Upon the successful completion of a particular objective, the student self-selects new content, new learning activities, new instructional modes, and new self-testing procedures. (Self-testing in questing is highly informal; it may consist of no

more than the student stating that he is finished in a particular area.) Questing is structured by the student, not by the teacher. The student may come to the teacher for help or he may not. Usually, the student will need the assistance of the teacher in his questing activities. Questing remains, however, an outward extension of the student's individual interests. The teacher is a guide, not a director.

This format for source guides is not unique to this Title III project. Colleges and universities are experimenting with such self-paced, self-directive, competency-based programs. Additionally, several secondary schools are actively engaged in constructing such programs. Many of the ideas expressed in this section originated in the article "An Instructional Management Strategy for Individual Learning," The Phi Delta Kappan, 49 (January 1968), 260-263.

Once the student has completed successfully his teacher-made formative evaluation, he may go "questing" or he may decide that he has no further interest in any learning activities related to the particular objective. Since he was successful with the evaluation, the student is free of this objective; he has closure. He can now move on to other objectives.

If, however, the student did not achieve mastery over the particular objective; i.e., he did not pass the formative evaluation at the prescribed level, then he must proceed through revised learning activities, revised instructional or learning modes, revised self-tests, and finally, through a revised teacher evaluation.

This must be done until the student is successful in mastering the particular objective or until it is determined that the student is cognitively unable to master the objective. All activities, modes, etc., must be revisions of the original. It is of no value to force the student "back through" the identical procedures that abetted his original failure. Further, if the teacher-made evaluation is truly formative or diagnostic in nature, it should be reasonably clear what particular elements led to the student's failure. The student should not be required to re-cover material already learned. His revised plan for learning should be so structured that his learning is directed toward the lack of knowledge that precipitated his failure. In brief, he learns only what he still needs to know to master the objective.

The process of re-directing a student's learning continues until he masters the objectives or until the teacher determines that such mastery is clearly not within the scope of his capabilities.

The Role and Responsibilities of the Project Teacher

Role of the Project Teacher

The role of the classroom teacher in this project is not the usual role of the dispenser of information. In this project, the classroom teacher is a guide, a leader, a curriculum developer, a tutor, and, occasionally, a traditional classroom teacher. The nature of this project is such that students can be highly independent in mastering the course objectives. It is questionable, however, as to the degree of independence each student will be capable of upon admission to the project. Becoming an independent, self-directive learner does not come about overnight. Indeed, our educational system has not been designed to produce such learners.

The long-range goal of the project teacher should, however, be consistent with facilitating the growth of independent, self-directive learning on the part of the student. Considerable guidance will be required on the part of the teacher, and each student must be handled on an individual basis. Certainly, each student should be given the opportunity to be independent in his learning.

All textbooks, books, films, videotapes, audiotapes, etc. should be considered as resource material. While teachers may wish to make specified periodic reading assignments, it must be noted that the learning activities designed for the source guides are the basic materials through which the student acquires competency in the required objective. This project is not a textbook-oriented project.

These responsibilities, while challenging, also offer the widest possible latitude in terms of the development of a content curriculum that is dynamic rather than static. Each classroom teacher prepares his or her own materials with the assistance of the media specialist. Such an approach gives the teacher the opportunity to be the originator of a curriculum, rather than a dispenser of a curriculum.

Classroom teachers will also be provided with assistance from consultant specialists in the content areas. An evaluation specialist will also be available for special assistance. Requests for such help should be made through the project Director.

Responsibilities of the Project Teacher

(These will be initiated during the Summer Workshop and continued throughout the year.)

1. To explore the existing content of English I, Mathematics I, and Science I.

2. To determine the appropriateness of the existing content of English I, Mathematics I, and Science I.

3. To identify appropriate course content for English I, Mathematics I, and Science I.

4. To write behavioral objectives for appropriate course content for English I, Mathematics I, and Science I.

5. To identify learning activities for the behavioral objectives for English I, Mathematics I, and Science I.

6. To prepare those learning activity aids that will facilitate student acquisition of the behavioral objectives for English I, Mathematics I, and Science I.

7. To design evaluation measures and activities that will measure the student's acquisition of the behavioral objectives for English I, Mathematics I, and Science I.

8. To design those evaluative instruments that will measure the student's attitude toward learning in the particular content area.

9. To design those evaluative instruments that will measure the student's self-concept with respect to the content area and with respect to other students.

10. To evaluate the appropriateness of selected content, behavioral objectives, and multi-sensory aids.

Sample Project Forms

SOURCE GUIDE

Subject Area

INSTRUCTIONAL OBJECTIVE

PROFICIENCY PRE-TEST

LEARNING ACTIVITIES

A. In the classroom, the student will:
1.

2.

3.

B. In the IMC, listen to, observe, or use:
4.

5.

C. In the Library, read the following materials:
6.

7.

D. Other Activities:
8.

9.

10.

SELF-TESTING

EVALUATION

QUESTING

Study Guide for Objective_____ _____
Subject Area

The following questions and/or activities should help you pass the test for Objective_____. Read the material carefully and complete the questions/activities. Ask the teacher if special help is needed.

1.

2.

3.

4.

5.

6.

SUPPLEMENTARY LESSON INFORMATION

Subject Area

To the teacher:

The purpose of Supplementary Lesson Information is to provide the student with any additional or supplementary information he may need to complete the required objective successfully. For example, in a self-instructional package in science, you may wish to have the student conduct an experiment as one of the Learning Activities. The directions for this experiment should be included in the self-instructional package on the Supplementary Lesson Information sheet.

In brief, if the student needs additional information to master any objective, that information should be placed on this sheet.

WORKSHEET

_____
Subject Area

To the teacher:

The purpose of Worksheets is to provide the student with practice exercises that will facilitate his acquisition of competency over the specified objective. Worksheets may be similar to exercises found in workbooks. The important consideration is that the student is provided with the kind and level of practice needed to accomplish the objective.

PROFICIENCY PRE-TEST

This pretest for objective_____ is designed to see which of the Learning Activities related to the objective you should complete. Your score on this test will not affect your grade. Your score will tell you what you need to do to meet the objective. When you complete this pre-test, give it to your teacher to be scored. The teacher will discuss the results with you and plan your course of study.

SELF-TEST

This self-test for objective_____is designed to let you decide how much progress you have made in completing the objective. The self-test covers the Learning Activities for the objective. Answers to the self-test are printed upside down at the bottom of the last page. Take the self-test, score it, and, if necessary, talk to the teacher about the results.

EVALUATION

This test for objective_____is designed to measure your mastery of the objective. This test is not to be taken until you have completed the Learning Activities and have taken the Self-Test. When you finish this test, it will be scored and discussed with you.

STUDENT EVALUATION

Student Name_____ _____
Subject Area

Date_____

Objective Number_____

How much time did you spend on this lesson?_____hrs.

Rate each Learning Activity according to its assistance in completing this objective.

Learning Activity	Value			Check if interest level was Acceptable
	Poor	Average	Good	
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

If you had difficulties with this lesson, describe the problems.

TEACHERS ONLY

Were modifications made in the objective and/or the instructional package? Yes_____No_____

What was the nature of the change(s)?

The Reading Program

Preliminary Information

The existing Lincoln Community High School remedial reading program is meeting the needs of those students who present general, non-critical word recognition, comprehension, and reading-study skill problems. The program has not, however, been an effective tool for a learning disabilities student. Remedial reading instruction is often unsuccessful with the student with learning deficits because while remedial instruction in a laboratory setting may improve general reading skills, such instruction does not and can not provide the highly individualized help the student with learning deficits must have if he is to be successful in his reading of English, mathematics, and science textbooks.

Remedial reading programs have characteristically been forced to structure their remedial learning experiences around the basic, general reading needs of their students. This necessity for re-teaching basic reading skills and abilities creates an instructional gap between reading in the remedial laboratory and reading in the classroom. That is, the material that the student reads in the reading laboratory is likely to bear no resemblance to the reading he does in the content area classroom. Consequently, the student is left in the unenviable position of receiving direct reading instruction in the reading laboratory that has little or no direct transfer value for the actual content area reading that he must do.

Further, instruction of students with learning deficits in the remedial center fails to take into account the fact that the student may be unable to learn from traditional instructional methods. Students with learning deficits require instructional modalities that are matched to their visual, auditory, and kinesthetic propensities; that is, to their individualized learning modalities.

The problems of a student with a learning deficit are compounded by the nature of the textbook he is forced to use in the classroom. There is ample evidence in the research literature to support the contention that the high school content area textbooks are clearly inappropriate for the student with learning deficits who enters the secondary school reading at a fourth grade level.

Miller, in a study of the readability levels of five widely used junior high industrial arts textbooks, found that in the textbook assessed as most useful, it was above the reading level of 55% of the students. In the textbook assessed as the most difficult, it was beyond the reading level of 86.4% of the readers. Jacobson emphasized that in the selection of physics and chemistry texts, there was no evidence that reading difficulty had been considered as a criterion of acceptability by those responsible for selecting books for adoption. Aukerman concluded that there are few, if any, literature anthologies that can be read at the independent reading level by any secondary school students in the bottom 25%, since such students are reading at the fifth grade and below.

Difficulty with reading has remained relatively constant among those students with learning deficits entering Lincoln Community High School over the past four year period. The data obtained from a reading sub-test of a standardized achievement test reflect this consistency.

	Reading Levels		
	6th grade or below	5th grade or below	4th grade or below
1967-68 Freshman Class	28%	16%	5%
1968-69 Freshman Class	25%	16%	7%
1969-70 Freshman Class	28%	16%	5%
1970-71 Freshman Class	25%	13%	6%

To summarize the data of the past four years, 25% or more of the entering Freshmen have reading ability levels 2 years or more below the expected grade equivalent. Between 13% and 16% of the students are reading 3 years or more below the expected grade equivalent. Finally, 5% to 7% of the incoming students are reading 4 years or more below the expected grade equivalent.

The new reading program does not neglect the reality of improving the reading abilities of the disabled learner. The present Reading Laboratory facilities for these students will be maintained. Direct learning experiences in the laboratory will, however, be altered on an individual basis to take advantage of the facilities in the Instructional Materials Center. Further, as the preferred learning modalities for each disabled learner is diagnosed, reading materials and reading procedures in the Reading Laboratory will be

adjusted to meet the individual needs of each disabled learner. Once the preferred learning modalities have been identified, it is anticipated that directed reading instruction can be accelerated as student frustration and failure in reading situations are minimized.

The Reading Program: Scope and Sequence

The scope of the reading program will include development and/or improvement of the following skills:

I. Word Recognition
   - A. Sight Words
   - B. Phonics
   - C. Structural Analysis
   - D. Context Clues

II. Comprehension
   - A. Literal
   - B. Inferential
   - C. Critical
   - D. Creative

III. Study Skills
   - A. SQ3R approach to study
   - B. Using a textbook
   - C. Locating information
   - D. Making outlines
   - E. Taking tests
   - F. Reading in content areas
   - G. Recognizing patterns of writing

The reading teacher will work with the target students individually and in small and large groups in order to develop these skills on the basis of individual needs. The target students will also work independently in the Instructional Materials Center with various media for the reinforcement of

skills previously introduced. Skill lessons will be recorded on audiotapes, videotapes, tape-slide sequences, etc.

The reading teacher will provide for individual learning modalities whenever possible. If, after diagnostic testing, a student's primary learning modality appears to be visual, the reading teacher will attempt to structure his learning in that direction by presenting his material visually. Other students may learn best by auditory, kinesthetic, or tactile senses. Attempts will be made to present the needed skills in as many learning modalities as possible.

One of the significant reading program considerations is that the teacher should appeal to the students' interests. The program will be flexible in order to provide for the varied interests of the target students. Attempts will be made to determine the particular interests of the target students and to structure learning activities based upon these interests.

Responsibilities of the Reading Teacher

1. To write behavioral objectives for the development of phonics skills for the target students.

2. To write behavioral objectives for the development of structural analysis skills for the targer students.

3. To write behavioral objectives for the development of comprehension skills for the target students.

4. To write behavioral objectives for the development of reading-study skills for the target students.

5. To identify high interest, low vocabulary reading materials for the target students.

6. To identify standardized diagnostic reading tests that assess reading achievement of target students.

7. To identify non-standardized diagnostic reading tests that assess reading achievement of target students.

8. To develop audio aids and techniques for target group reading instruction.

9. To develop visual aids and techniques for target group reading instruction.

10. To develop kinesthetic aids and techniques for target group reading instruction.

11. To develop a remedial plan of action for working with target students on an individual, a small group, and a total class basis.

12. To identify procedures and practices for coordinating the work of the remedial reading teacher with the content area teacher.

13. To develop specific procedures for counseling with parents of target students.

14. To design informal evaluative techniques for assessing attitudes toward reading of target group students.

SOURCE GUIDE

401.1
Subject Area

INSTRUCTIONAL OBJECTIVE--Given information about the 220 words of the Dolch List, the student will be able to recognize the sight words by means of their shape or configuration, rather than by blending the parts into a whole.

PROFICIENCY PRE-TEST
Gray Oral Reading Test, Form A
Botel Inventory, Dolch Test, Form A

LEARNING ACTIVITIES

A. In the classroom, the student will:

VT 1. Make a file of all sight words--write or type the word and use the word in a sentence on a 3" x 5" card.

VT 2. Play Concentration with Dolch word cards (you must get a match and be able to say the word.)

B. In the IMC, listen to, observe, or use:

Av 3. Look at slides of Dolch words, with accompanying cassette tape--#401.1 "Dolch Words"

C. Other Activities:

VT 4. Get worksheet SW-1, A,B, and/or C in the packet, read the directions, fill it out, and return it to the teacher.

VT 5. Get worksheet SW-2, A,B, and/or C in the packet, read the directions, fill it out, and return it to the teacher.

SELF-TESTING

Check out a blank cassette tape. Get the list of Dolch words in this packet. As you read each one, record it on tape and return it to the teacher.

EVALUATION

Dolch list again, Form B, administered by the teacher.

QUESTING

SWI - A

401.1
Subject Area

WORKSHEETS

RECOGNIZING WORDS I

Look closely at the first word on each line. Then find the same word among the three words that follow. Underline this word. On some lines there may not be two words alike. If so, skip the line and go on. See how many seconds it takes you to play this game. The first line is done for you.

are	army	were	<u>are</u>
this	whose	that	this
and	and	have	ban
said	sand	and	said
come	came	come	one
away	have	always	away
here	there	where	never
saw	saw	has	was
have	leave	have	great
will	not	wild	will
was	were	was	saw
who	what	do	who
make	many	rack	note
some	neat	some	same
around	away	ground	around

SWI - B

WORKSHEET

401.1
Subject Area

RECOGNIZING WORDS II

Look closely at the first word on each line. Then find the same word among the three words that follow. Underline this word. On some lines there may not be two words alike. If so, skip the line and go on. See how many seconds it takes you to play this game. The first line is done for you.

from	to	form	<u>from</u>
soon	some	seen	soon
after	halt	after	rafter
your	you	your	guard
under	enter	thunder	under
find	find	bend	fund
with	when	sinter	wilt
know	knew	how	know
were	went	were	never
that	gnat	thick	flat
again	always	again	open
once	cool	angry	once
there	these	there	where
upon	open	under	apt.
would	would	mild	could

SWI - C

WORKSHEET

401.1
Subject Area

RECOGNIZING WORDS III

Look closely at the first word on each line. Then find the same word among the three words that follow. Underline this word. On some lines there may not be two words alike. If so, skip the line and go on. See how many seconds it takes you to play this game. The first line is done for you.

where	what	<u>where</u>	when
these	these	there	those
their	here	their	hair
done	bend	down	honor
never	were	ever	never
write	write	wire	mile
myself	yourself	myself	shelf
shall	will	chill	slow
hold	hold	bold	melt
use	amuse	ore	use
hurt	hurl	hurt	bowl
laugh	laugh	tough	taught
eight	ought	sight	eight
kind	hind	king	limb
thank	frank	thank	slack

SW II - A

401.1
Subject Area

WORKSHEET

FIND THE WORD I

In each line going across, there are four groups of letters. Only one group is a word. Circle the letters that make a word. The first one is done for you.

ard	and	nad	lon
this	silt	hist	sint
dais	asdi	said	sede
rea	are	rew	reo
onde	ceme	meec	come
away	owoy	yoaw	waya
heer	reeh	here	veet
cor	saw	vos	swa
weeh	heve	have	bave
witt	rilt	lill	will
was	ows	sev	ros
huw	bew	who	woh
keam	make	amke	hake
some	sime	mose	cume
rando	norad	droun	around

SW II - B

WORKSHEET

401.1
Subject Area

FIND THE WORD II

In each line going across, there are four groups of letters. Only one group is a word. Circle the letters that make a word. The first one is done for you.

forn	from	morf	romf
soon	caan	onos	noos
after	fater	ofter	ratef
vouy	your	yoru	rouy
noder	nuder	onder	under
find	dlin	lind	dinf
whil	twih	with	thiw
know	nowh	kwaw	knaw
wrec	werc	were	wree
thot	that	tahl	tath
cogin	goon	again	ogoin
omco	once	noce	anco
theer	theve	heret	there
upan	upon	ugan	opun
would	wcold	woolb	woalh

SW II - C

WORKSHEET

401.1
Subject Area

FIND THE WORD III

In each line going across, there are four groups of letters. Only one group is a word. Circle the letters that make a word. The first one is done for you.

wreeh	wheer	where	wheve
steeh	thees	heest	these
dono	done	node	hobe
merev	hever	never	vreen
their	theiv	reith	thire
write	wrile	urite	wriet
nyself	muself	myselk	myself
skall	shall	holls	slalh
dloh	bloh	holb	hold
esu	use	ure	osc
urth	thur	hurt	roth
laugh	lough	taugh	glauh
theig	gheit	teigh	eight
nidk	kind	dink	knid
knath	kanth	thank	tankh

STUDENT EVALUATION

Student Name _____ READING
Subject Area

Date _____

Objective Number 401.1

How much time did you spend on this lesson? _____ hrs.

Rate each Learning Activity according to its assistance in completing this objective.

	Learning Activity	Value			Check if interest level was Acceptable
		Poor	Average	Good	
VT	1. Make a file of words	____	_____	____	_____
VT	2. Play Concentration with Dolch cards	____	_____	____	_____
AV	3. Slide packet of Dolch words and tape	____	_____	____	_____
VT	4. Worksheets SW I-A,B,C	____	_____	____	_____
VT	5. Worksheets SW II-A,B,C	____	_____	____	_____

If you had difficulties with this lesson, describe the problems.

TEACHERS ONLY

Were modifications made in the objective and/or the instructional package? Yes _____ No _____

What was the nature of the change(s)?

The English Program: Scope and Sequence

The scope of the Title III English program encompasses three basic areas: language, communication, and literature. The subdivisions of these areas include:

1) Language (grammar, dialectology, language history, semantics, punctuation and capitalization, and spelling)

2) Communication (listening, speaking, and writing)

3) Literature (short story, poetry, novel, and plays)

Additionally, a unit on the library is provided by the library staff.

The broad goals of the English program are to provide success experiences for students in the areas of language, communication, and literature through the use of multi-sensory aids. Through behavioral objectives, the student will move from the simple to the complex and apply the knowledge and skills gained in a meaningful way.

The major emphasis of the English program is directed toward helping the students to improve their ability to communicate by an application of the knowledge and skills gained, and by helping the students to gain an appreciation for some areas of literature for their immediate gratification as well as for a later appreciation for literature as demonstrated by their improved attitude and approach toward reading, viewing, listening, etc.

SOURCE GUIDE
(WHAT YOU NEED TO KNOW)

3.00.06
Subject Area

OBJECTIVE 3.00.06
(WHAT THE TEACHER WANTS YOU TO BE ABLE TO DO:)
You will be given information on how meaning affects language. There will be ten questions on the information in class and on the activities done in the IMC and the library. You will be expected to answer at least eight questions correctly.

PRETEST--The pretest is scored. It does not count, however, for a grade. You are to answer the questions to the best of your ability. If you cannot answer any questions, do not worry. This test is simply to see how much you already know about the subject. What you do not know, you will be able to learn as you complete the objective.

LEARNING ACTIVITIES

A. In the classroom, you will:
   1. Work on those worksheets 3.00.06 that require dictionary work with tape T-3-9.
   2. Work on those worksheets 3.00.06 that require Our American Language as a textbook.

B. In the IMC, listen to, observe, or use:
   3. Tape T-3-11 on symbols. There is a worksheet in your package that goes with the tape. The directions are on the worksheet, make sure to read them first.
   4. Tape T-3-9 on dictionary skills. There is a worksheet in your package that goes with the tape. The directions are on the worksheet; make sure you read them first.
   5. Tape T-3-12 on gestures and facial expression. There is a worksheet in the package which goes with the tape. The directions are on the worksheet. Be sure to read the directions first.

C. In the Library, read the following materials:
   6. Check out the Oxford Dictionary of English Etymology in the library. There is a worksheet in the last half of your package which you use with the dictionary. The directions are on the worksheet--be sure to read them first.
   7. Our American Language is also in the library, ask for it at the desk for the worksheet you need it for.

SELF-TESTING--The self-test is designed to help you know when you are ready for the evaluation. Do not ask for the evaluation until you have taken it. Use your study guide to help you. Answer the questions on the test. If you do not score more than 7 right, go over the Study Guide again and review the material. Then take the self-test again until you score over 7. When you do this and are sure you are ready, ask for the evaluation test. Remember the evaluation test will count.

EVALUATION--This is the final step in the objective. Make sure you are ready. Do not just take the test because you are through with the activities. Review the activities. Follow your study guides. Study. Take the self-test, then ask for the evaluation. You will be expected to answer 75% of the questions correctly.

QUESTING--Questing is any extra study that you would like to do on the objective. If you are interested in what you have learned in this objective, come and see me and tell me what you would like to do or I can give you some suggestions.

SUPPLEMENTARY SHEET

3.00.06
Subject Area

All of the lessons which follow will help you learn that "Language is a set of symbols having meaning by common agreement." We must agree on the meanings of words. If we did not agree that dog means an animal covered with hair, having four legs, a tail, an animal which barks and can bite, then I could call my house a dog. READ THE DIRECTIONS FOR EACH LESSON CAREFULLY.

Name _____

Date _____

WORKSHEET

3.00.06
Subject Area

I. Listen to tape T-3-11 to find out what a symbol is. After you are finished, answer this question--what is a symbol?

1. What is a symbol?

2. What are some examples of symbols in our language?

After you are done, bring your worksheet to me for the answers.

THIS HANDOUT IS TO GO WITH OBJECTIVE 3.00.06

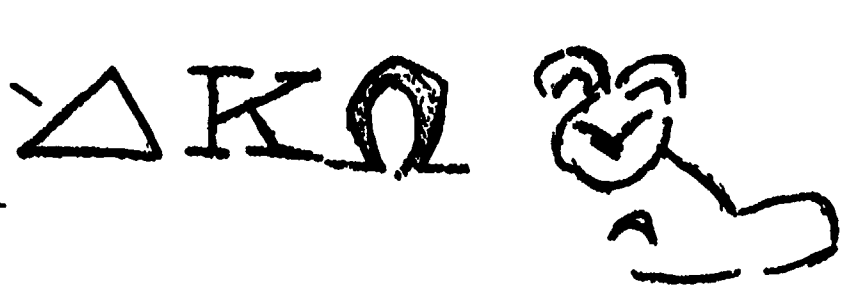
I. SYMBOLS

PEACE SYMBOL

STOP LIGHT

FLAG

CLUBS



II. OUR LANGUAGE IS MADE OF SYMBOLS

ALPHABET based on sounds

A B C

WORDS based on meaning

LANGUAGE IS MADE OF

Written language

oral language

Name_____

Date_____

WORKSHEET

3.00.06
Subject Area

II. Read page 20 from Our American Language and answer these questions by filling in the blanks; this assignment is to help you to understand what a symbol is. If you did not fully understand the tape on symbols T-3-11, read this short passage and answer the questions. This should help you to understand better.

1. All the words we use are really _____ for things or ideas.

2. A traffic light is a word, it stands for something. A traffic light is a_____.

1. symbols
2. symbol

WORKSHEET

3.00.06
Subject Area

III. Listen to the tape on dictionary skills T-3-9. What do we mean when we say we must agree on the meanings of words? Give an example. Do words ever change meanings? How?

1. What do we mean when we say we must agree on the meaning of words? Give an example.

2. Do words ever change meanings? How?

WORKSHEET

3.00.06
Subject Area

Take a look at the cartoon that follows. Something is wrong. The two players in the cartoon are not understanding each other. Answer the questions below:

1. What word in the cartoon is causing all the problem? What word is it that keeps the players from understanding one another?

2. What does "ball" mean to the pitcher?

3. What does "shirt" mean to the catcher?

4. What is wrong in the cartoon?

5. Remember we said that meaning has to be agreed upon--is this what is wrong?

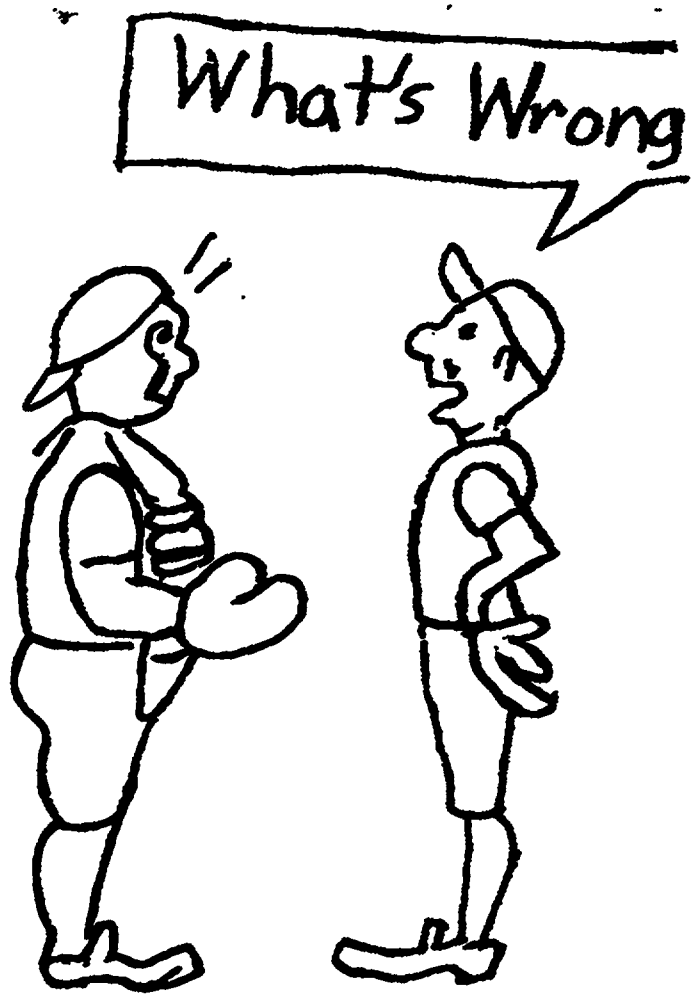
ANSWERS

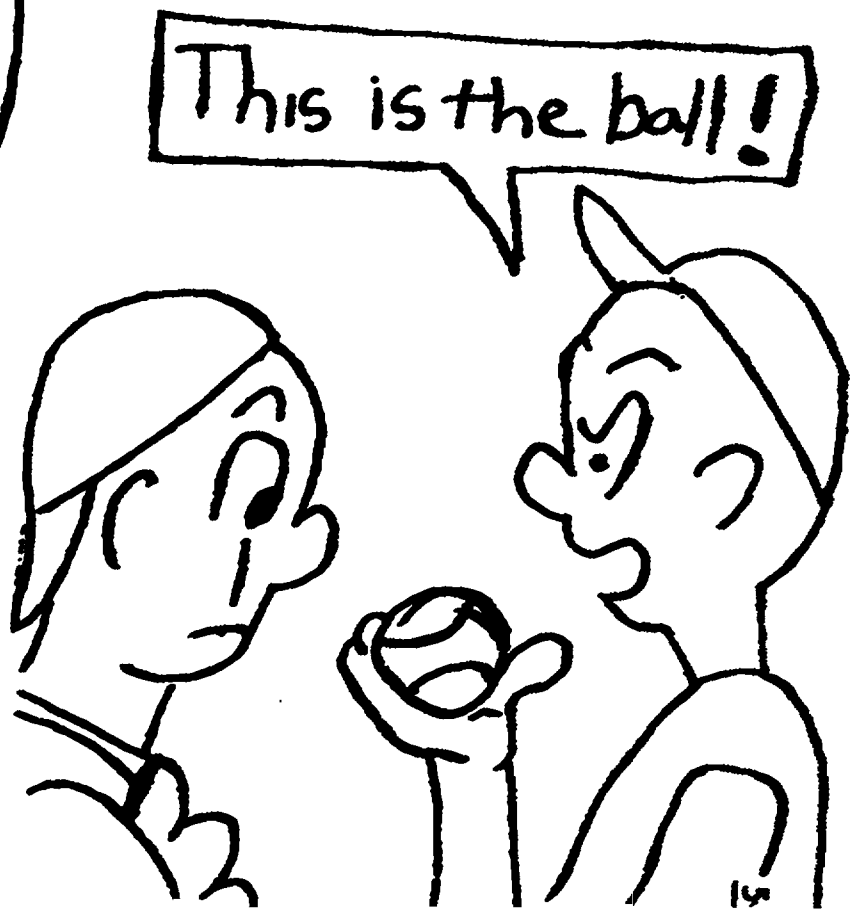
1. Ball and shirt
2. Ball to the pitcher is the same thing we think of as ball.
3. Shirt to the catcher is a ball.
4. The problem is that the catcher is mixing up the meaning of shirt and ball.
5. Yes, the problem is agreement of meaning. To the catcher, a ball is a shirt because this is what he calls it. To the pitcher, ball is what we all think of as ball. The catcher is an example of a person that does not agree with the meaning of a word. Whenever this happens, there is confusion.


Throw your shirt Faster.
?


STOP!!


Are you mad!? My shirt is not the ball...


What's Wrong


This is the ball!

Name_____

Date_____

WORKSHEET

3.00.06
Subject Area

IV. Remember how we got the word "Quiz." We got it from the Irish when one fellow made a bet with another that he could invent a new word. That man went around and wrote "quiz" on everyone's door and people began to ask about the word. This is how he got people to use it and this is how it got its meaning. Write out how you would get people to use a word.

SUPPLEMENTARY SHEET

3.00.06
Subject Area

All of the lessons which follow will help you learn that language changes. Words come and go. There are many words that we no longer use. There are many words which are new; words that we have invented for our language or borrowed from others. These are words that last a long time or words which last for only a short time. There are are words which have new meaning that we have made. Read the directions carefully. If you have any questions, come and ask the teacher.

Name_____

Date_____

WORKSHEET

3.00.06
Subject Area

I. These are words which we no longer use at all or words which we use very little. Go into the library and find out how we got the word. What does the word mean? Look in the Oxford Dictionary of English Etymology. Ask the librarian where it is. When you are done, bring your worksheet to me to be checked.

How did we get this word:	This word means:
1. amour	
2. ballyhoo	
3. bamboozle	
4. belle	
5. apothecary	
6. athwart	
7. bairn	
8. caboodle	
9. calaboose	
10. barouche	

Name_____

Date_____

WORKSHEET

3.00.06
Subject Area

II. Read from Our American Language, pages 21-23. Answer these questions.

1. Where do we get these words?

   a. calico

   b. punch

   c. chivalry

   d. boycott

   e. jello

   f. two strikes against them

   g. home stretch

2. Does slang last a long time? Why?

Name_____

Date_____

WORKSHEET

3.00.06
Subject Area

III. Find out the meaning of these words. Fill-in the blanks. Come to me to check your answers.

1. "hood" We like all people in our hood. Hood means:

_____

2. "Low rider" It is really cool to be a low-rider, riding in a big car. Low-rider means:_____

3. "bod" Oh! That water feels good on my bod. Bod means:

_____

4. "Moldy" Mrs. Johnson don't give me that moldy book. Moldy means:_____

5. "Que Pasa?" Que pasa, brother? Que pasa means:

_____

Name_____

Date_____

WORKSHEET

3.00.06
Subject Area

These are new words we have made for our language. Write the meanings of these words. Come to me to check your answers.

1. Uncola

2. now generation

3. generation gap

4. hippie

5. speed

6. super star

7. cop out

8. the establishment

9. freak

10. acid-head

Name_____

Date_____

WORKSHEET

3.00.06
Subject Area

These words have different meanings. Many of the English speakers have added meanings to these words. Look them up in the dictionary. Write out all the meanings.

1. prop

2. bad

3. black

4. ring

5. circle

SUPPLEMENTARY SHEET

3.00.06
Subject Area

All of the following activities are designed to show you that certain things affect meaning. Certain things like gestures (gestures are movements of the hands or body) or facial expression, may make a difference in how we understand the meaning of what is being said to us. Also, spoken language is different from written language. In written language, we do not have gesture or facial expression to give us a cue to the meaning we only have words, so when we write we must choose the right word with the right meaning.

Name_____

Date_____

WORKSHEET

3.00.06
Subject Area

You will need tape T-3-12 for this lesson. Listen and follow directions. There is a folder and stand which goes along with the tape. Make sure you get it from the desk before you start. Use this sheet to answer the questions which will be on the tape. Listen carefully and repeat the lesson if necessary.

STUDY GUIDE

3.00.06
Subject Area

To be able to pass your evaluation and score very high, follow these directions for studying. These are the things you will need to know.

1. Know what these words mean:

   a. symbol
   b. language
   c. slang
   d. gestures

THESE WORDS WERE DEFINED AT THE BEGINNING OF THE LESSONS. REREAD THE DIRECTIONS TO THE LESSONS AND THE SUPPLEMENTARY SHEETS.

2. Pay attention to the words you are asked to look up in your lesson. Be able to use some of these as examples.

   a. know some examples of symbols
   b. know some examples of words which we no longer use
   c. know some examples of slang words and how we got them
   d. know some examples of words we have made for our language
   e. know some examples of words with many meanings

3. Pay close attention to the tape and lesson on how gestures and facial expression affect meaning. How do they affect meaning?

STUDENT EVALUATION

Student Name_____ English
Subject Area

Date_____

Objective Number 3.00.06

How much time did you spend on this lesson?_____hrs.

Rate each Learning Activity according to its assistance in completing this objective.

	Learning Activity	Value			Check if interest level was Acceptable
		Poor	Average	Good	
AVT	1. Dictionary worksheet with tape T-3-9	____	_____	____	_____
VT	2. Worksheets with text American Language	____	_____	____	_____
AVT	3. Tape 3-11 and worksheets	____	_____	____	_____
AVT	4. Tape 3-12 and worksheet	____	_____	____	_____
VT	5. Worksheet with Oxford Dictionary	____	_____	____	_____

If you had difficulties with this lesson, describe the problems.

TEACHERS ONLY

Were modifications made in the objective and/or the instructional package? Yes_____No_____

What was the nature of the change(s)?

<u>The Science Program</u>

The Science Program: Scope and Sequence

The Title III Science program is designed to prepare the students for further investigation in biology, chemistry, and physical science. Particular emphasis will be directed toward physical science. The program is designed also to provide for the needs of those students who choose not to pursue further study in science.

The program objectives were selected from a variety of sources. Selection criteria were developed to correlate with the highly individualized needs of students with learning disabilities.

SOURCE GUIDE

SCIENCE (MATTER) 203.3
Subject Area

OBJECTIVE (Problem)

You will be given gases, liquids, and solids. Your problem is to calculate the volume and mass of these substances in beads, grams, and cm^3 .

PRE-TEST

This test is to tell you and me if you can already solve the problem. You will be given ten substances. You are to determine their mass in grams and beads and their volume in ml and cm^3 . You must get 7 out of 10 correct to pass this test.

ACTIVITIES TO HELP YOU SOLVE THE PROBLEM:

A. In the IMC:

1. Listen to tape 3 which explains the packet.

AVT 2. Listen to cassette tape 203.3, 203.3B, and Tape E which explain how to solve the problem.

AV 3. View slide packet 203.3 and listen to accompanying tapes 203.3 and 203.3B

AV 4. View video tapes 203.3 and 203.3B which show how to solve the problem.

B. In the classroom:

AVT 5. Do the lab series which will help you solve the problem.

AVT 6. Write down or ask questions you have.

C. Other Activities:

AVT 7. Practice calculating volume and mass of substances in the lab on the worksheets.

V 8. Read pages 6-19 in Introductory Physical Science.

SELF-TEST

Take all the substances we have used in the lab or any other substances you may wish to use and calculate their volume and mass.

EVALUATION

You will help me make this test.

QUESTING

If you want to learn more about the volume and mass of substances, see me.

Name _____

Date _____

PRETEST

203.3
Subject Area

This test is to tell you and me if you can already solve the problem. You will be given ten substances. You are to determine their mass in grams and beads and their volume in ml and cm^3. You must get 7 out of 10 correct to pass this test.

	Mass		Volume	
	Grams	Beads	ml	cm^3
1. rubber stopper	____	____	____	____
2. large block of wood	____	____	____	____
3. water	____	____	____	____
4. rock	____	____	____	____
5. small block of wood	____	____	____	____

	Mass		Volume	
	Grams	Beads	ml	cm^3
6. gas in top of an Alka-seltzer tablet	_____	_____	_____	_____
7. piece of lead	_____	_____	_____	_____
8. colored water	_____	_____	_____	_____
9. steel block	_____	_____	_____	_____
10. nail	_____	_____	_____	_____

Name_____

Date_____

WORKSHEET

203.3
Subject Area

Problem: You are to determine the volume of items you have in cm^3 .

Items	Volume in cm^3
1. rock	_____
2. wood	_____
3. nail	_____
4. rubber stopper	_____
5. water	_____
6. metal block	_____
7. piece of wire	_____

How did you determine the volume of these items?

Name_____

Date_____

WORKSHEET

203.3
Subject Area

Pour some sand in a graduated cylinder until it is about two-thirds full.

Problem: What is the volume of only the sand?

Procedure:
Record the volume of the sand.

Pour the sand into a jar.

Pour H_2O into the graduated cylinder until it is about one-third full. Record the volume in cm^3.

Add the sand to the H_2O.

What is the volume of the sand and H_2O in cm^3 ?

From the last two readings, calculate the volume of the sand.

What is the volume of the air spaces?

Materials:

50 cm^3 graduated cylinder
Dry sand (about 40 cm^3)
Water
Jar or beaker

NOTE: Record all volume in cm^3 in the blanks on the next page which is the Data Sheet.

Name_____

Date_____

DATA SHEET

NOTE: Record all volume in cm^3 .

Volume of dry sand _____

Volume of H_2O placed in graduated cylinder _____

Volume of sand and H_2O _____

Volume of sand only by water displacement _____

Volume of air spaces _____

Name_____

Date_____

STUDY QUESTIONS FOR OBJECTIVE 203.1

I.P.S. pages 6-11

1. What is volume?

2. What units do we use to measure volume?

3. 1 cm^3 = _____ml

I.P.S. pages 11-19

4. What is mass?

5. What units do we use to measure mass?

Name _____

Date _____

WORKSHEET

203.3

MASS OF MIXED SOLUTIONS

A.

1. Pour lead nitrate into a small bottle until it is about 1/3 full. Pour the same volume of sodium iodine into another bottle.

2. Weigh the bottles.

3. Pour the contents of one into the other.

4. Weigh both bottles.

Did the mass change as a result of mixing?

Name_____

Date_____

WORKSHEET 203.3

MASS OF MIXED SOLUTIONS

B.

1. Put 2 grams of copper in a test tube and 1 gram of sulphur.

2. Put a rubber stopper into the test tube.

3. Weigh the test tube.

4. Gently heat the mixture, until it begins to glow.

5. Set the test tube aside until it cools.

6. Re-weigh the test tube.

Has the mass changed?

Do you think the substance in the bottom of the test tube is copper, sulphur, or a new substance?

Name_____

Date_____

WORKSHEET 203.3

THE MASS OF GAS

1. Weigh a bottle 1/3 full of H_2O and 1/8 of an alka-seltzer tablet.

2. Place the tablet in the bottle and quickly screw the cap back on.

3. When reaction stops, slowly loosen the cap.

Do you hear gas escaping?

4. Weigh the bottle again.

What do you conclude?

SUPPLEMENTARY LESSON SHEET 203.3

The following terms are terms we will be using in the lab. You should become familiar with the terms so you will understand what is taking place in the lab.

Volume -- The amount of space an object takes up.

Mass -- Weight (quantity of matter)

Water displacement -- determine volume of irregular shaped objects.

LxWxD = cm^3 -- regular shaped objects

Granular substances -- lab on H_2O displacement of sand.

Conservation of mass -- The mass of substances is unchangeable.

Mass of a gas -- lab on alka-seltzer

1 cm^3 = 1 ml

STUDY GUIDE

SCIENCE 203.3
Subject Area

You should complete this study guide before you take your self-test by writing the answers on this sheet. Hand this to me and let me check your answers.

1. Which of the following terms are used when we calculate mass? (ml, gram, bead, and cm3)

2. Which of the following terms are used when we calculate the volume? (ml, gram, bead, and cm^3)

3. List the equipment you would use to calculate mass.

4. List the equipment you would use to calculate volume.

5. Explain water displacement.

6. Summarize what you did in the lab.

Name_____

Date_____

SELF-TEST

SCIENCE 203.3
Subject Area

Take all the substances we have used in the lab or any other substances you may wish to use and calculate their volume in ml and cm^3 and mass in grams and beads.

Substance	Volume	Mass
1.	cm^3	grams
2.		
3.		
4.		
5.		
6.		
7.		

STUDENT EVALUATION

Student Name_____

Date_____

Objective Number 203.3

SCIENCE (MATTER)
Subject Area

How much time did you spend on this lesson?_____hrs.

Rate each Learning Activity according to its assistance in completing this objective.

	Learning Activity	Value			Check if interest level was Acceptable
		Poor	Average	Good	
A	1. Tape 203.3, Tape 203.3B and Tape E	____	_____	____	_____
AV	2. Slide packet 203.3 and Tape 203.3B	____	_____	____	_____
AV	3. Videotape 203.3 and Vidoetape 203.3B	____	_____	____	_____
AVT	4. Laboratory activity series	____	_____	____	_____
AVT	5. Write down and ask about questions	____	_____	____	_____
AVT	6. Practiced calculating volume & mass of substances	____	_____	____	_____
V	7. Read pp. 6-19 in Introductory Physical Science	____	_____	____	_____

If you had difficulties with this lesson, describe the problems.

TEACHERS ONLY

Were modifications made in the objective and/or the instructional package? Yes_____No_____

What was the nature of the change(s)?

The Mathematics Program: Scope and Sequence

The Title III multi-sensory program in Mathematics entails learning experiences through the use of audio, visual, and tactile materials, library materials, and classroom materials. The students will cover material similar to that in the regular classroom, but there will be increased emphasis upon work with materials presented via filmstrips, audiotapes, videotapes, game packages, etc. Materials developed by the teacher will be at the disposal of the students in the Mathematics files in the library.

The topics to be covered in the Matnematics class include: SETS, NUMBER SYSTEMS, WHOLE NUMBERS, RATIONAL NUMBERS, DECIMALS, RATIO AND PERCENTAGE, MEASUREMENT, AND ANALYSIS OF NUMERICAL DATA. Each topic has a set of packaged material containing: (1) an instructional objective for the lesson; (2) a proficiency pre-test; (3) a series of learning activities (in the classroom, in the Instructional Materials Center, in the Library, and other activities; (4) a self-test for the student to use to gauge his progress; (5) a teacher evaluation; (6) a set of questing exercises the student can pursue; and (7) an evaluation the student is to fill out on how well he thought the packet did what it was intended to do.

SOURCE GUIDE

SYSTEMS OF NUMERATION-1.200
Subject Area

INSTRUCTIONAL OBJECTIVE--1.201--Given a finite set, the student will be able to give the cardinal number of that set as demonstrated by achieving 75% accuracy on a completion (fill-in the blank) test.

PROFICIENCY PRE-TEST--The proficiency pretest will consist of giving the cardinal number of elements ten finite sets contain.

LEARNING ACTIVITIES

A. In the IMC, listen to, observe, or use:

V 1. Read the sheet titled "Modern Math"--2-1--Objective 1.201 p. 41-42.

VT 2. Read the sheet titled "Stein" pages 2-3

VAT 3. Listen to cassette tape #70 side B titled "Objective 1.201"

B. In the Library, read the following materials:

V 4. Read the section in the math files titled--"Systems of Numeration"

V 5. Look at slide presentation "Sets"

C. Other Activities:

AVT 6. Ask Mr. Little for help with the material.

SELF-TEST

Complete the self-test and correct it yourself.

EVALUATION

The evaluation will consist of giving the cardinal number of elements ten finite sets contain.

QUESTING

See Mr. Little to set up activities for questing.

Name_____

Date_____

PROFICIENCY PRE-TEST

This pretest for objective 1.201--Form A is designed to see which of the Learning Activities related to the objective you should complete. Your score on this test will not affect your grade. Your score will tell you what you need to do to meet the objective. When you complete this pre-test, give it to your teacher to be scored. The teacher will discuss the results with you and plan your course of study.

DIRECTIONS: Give the cardinal number of each of the following sets. Put your answer for each problem on the line after the problem.

1. $n\{0,1,2,3,4\}$ = _____

2. $n\{0,1,2,3,\ldots,10\}$ = _____

3. $n\{1,2,3,4\}$ = _____

4. $n\{\ \}$ = _____

5. $n\ \{0\}$ = _____

6. $n\{a,b,c,r,s,t,u\}$ = _____

7. $n\{0,1,a,m,x,5\}$ = _____

8. $n\{(1,3),(4,7),(8,1)\}$ = _____

9. $n\{19,28,\ 7,\ (6,15)\}$ = _____

10. $n\{a,b,c,d,\ldots,x,y,z\}$ = _____

Name_____

Date_____

PROFICIENCY PRE-TEST

This pretest for objective 1.201---Form B is designed to see which of the Learning Activities related to the objective you should complete. Your score on this test will not affect your grade. Your score will tell you what you need to do to meet the objective. When you complete this pretest, give it to your teacher to be scored. The teacher will discuss the results with you and plan your course of study.

DIRECTIONS: Give the cardinal number of each of the following sets. Put your answer for each problem on the line after the problem.

1. $n\{0,1,a,m,x,5\}$ = _____

2. $n\{(1,3),(4,7),(8,1)\}$ = _____

3. $n\{19,\ 28,\ 7,\ (6,15)\}$ = _____

4. $n\{0\{$ = _____

5. $n\{\}$ = _____

6. $n\{1,2,3,4\}$ = _____

7. $n\{a,b,c,r,s,t,u\}$ = _____

8. $n\{a,b,c,d,\ldots,x,y,z\{$ = _____

9. $n\{0,1,2,3,4\}$ = _____

10. $n\{0,1,2,3,4,\ldots,10\}$ = _____

SUPPLEMENTARY LESSON INFORMATION--1.201

SYSTEMS OF NUMERATION-1.200
Subject Area

Read this sheet after doing the Learning Activities.

A cardinal number tells how many elements are in a set. The symbol "n" is used when we want to know the cardinal number of a set.

The following sets are examples of finding the cardinal number of a set. "n {a,c,f} "= is read "the number of elements in the set containing a.c.f is..." The cardinal number of {a,c,f} is 3.

n {1,7,15,25} = 4
n {a,1,b,7,8,x} = 6
n {0,1,2,...,8} = 9
n {0,1,...,3} = 4

Study Guide for Objective 1.201 — Systems of Numeration--1.200 Subject Area

Answer these questions before taking the self-test.

The following questions and/or activities should help you pass the test for objective 1.201. Read the material carefully and complete the questions/activities. Ask the teacher if special help is needed.

1. To find the cardinal number of a set, what is the first thing to look for?

The number of elements in the set.

2. How do you write a set when you want the cardinal number of $\{13,a,b\}$?

It is written n $\{13,a,b\}$.

3. When you have completed these questions, continue on to the self-test. If you are having difficulty with the examples, ask Mr. Little for help.

Name_____

Date_____

SELF-TEST

This self-test for objective 1.201 is designed to let you decide how much progress you have made in completing the objective. The self-test covers the Learning Activities for the objective. Answers to the self-test are printed upside down at the bottom of the last page. Take the self-test, score it, and, if necessary, talk to the teacher about the results.

DIRECTIONS: Give the cardinal number of each of the following sets. Put your answer on the line.

1. $n\{s,t,a,r\}$ = _____

2. $n\{1,2,4,3\}$ = _____

3. $n\{(1,2),(3,4)\}$ = _____

4. $n\{0,1,3,a,b,m\}$ = _____

5. $n\{a,c,(b,d),4\}$ = _____

1. 4 2. 4 3. 2 4. 6 5. 4

Name_____

Date_____

EVALUATION

This test for objective 1.201--Form A is designed to measure your mastery of the objective. This test is not to be taken until you have completed the Learning Activities and have taken the self-test. When you finish this test, it will be scored and discussed with you.

DIRECTIONS: Give the cardinal number of each of the following sets. Put your answer for each problem on the line after that problem.

1. $n\{0\}$ = _____

2. $n\{a,b,c,r,s,t,u\}$ = _____

3. $n\{0,1,a,m,x,5\}$ = _____

4. $n\{(1,3),(4,7),(8,1)\}$ = _____

5. $n\{19, 28, 7, (6,15)\}$ = _____

6. $n\{a,b,c,d,\ldots,x,y,z\}$ = _____

7. $n\{0,1,2,3,4\}$ = _____

8. $n\{0,1,2,3,\ldots,10\}$ = _____

9. $n\{\}$ = _____

10. $n\{1,2,3,4\}$ = _____

Name_____

Date_____

EVALUATION

This test for objective 1.201--Form B is designed to measure your mastery of the objective. This test is not to be taken until you have completed the Learning Activities and have taken the self-test. When you finish this test, it will be scored and discussed with you.

DIRECTIONS: Give the cardinal number of each of the following sets. Put your answer for each problem on the line after that problem.

1. $n\{\ \} =$ _____

2. $n\{0,1,2,3,4\} =$ _____

3. $n\{0,1,2,3,\ldots,10\} =$ _____

4. $n\{a,b,c,r,s,t,u\} =$ _____

5. $n\{0\} =$ _____

6. $n\{0,1,a,m,x,5\} =$ _____

7. $n\{1,2,3,4\} =$ _____

8. $n\{(1,3)(4,7),(8,1)\} =$ _____

9. $n\{19,\ 28,\ 7,\ (6,15)\} =$ _____

10. $n\{a,b,c,d,\ldots,x,y,z\} =$ _____

STUDENT EVALUATION

Student Name_____ SYSTEMS OF NUMERATION-1.200
Subject Area

Date_____

Objective Number 1.201

How much time did you spend on this lesson?_____hrs.

Rate each Learning Activity according to its assistance in completing this objective.

	Learning Activity	Value			Check if interest level was Acceptable
		Poor	Average	Good	
V	1. Reading MM-2-1	____	_____	____	_____
TV	2. Reading Stein 2-3	____	_____	____	_____
VAT	3. Tape	____	_____	____	_____
V	4. Math files	____	_____	____	_____
V	5. Slides	____	_____	____	_____
AT	6. Mr. Little's aid	____	_____	____	_____

If you had difficulties with this lesson, describe the problems.

TEACHERS ONLY

Were modifications made in the objective and/or the instructional package? Yes_____No_____

What was the nature of the change(s)?

Program Evaluation

1. Evaluation of the Title III program will be a continuous process. This will be accomplished by periodically viewing data from the pretests and posttests, as well as staff perceptions recorded at various intervals. This periodic review can result in changes in: (a, either pretests or posttests; (b) particular objectives; (c) organization of objectives; (d) learning activities; (e) evaluation instruments.

2. To facilitate this type of evaluation, a member of the project staff will adopt the role as process evaluator. Mr. Bill Heien will assume the responsibilities of process evaluator. He will collect systematic information to provide for the identification and monitoring of potential sources of failure in the instructional program, e.g. pretests, individualization, posttests, improper diagnostics, unavailability of different modalities, interpersonal relationships among staff and students, logistics, understanding of and agreement with the intent of the program by persons involved in it and affected by it, adequacy of resources, etc.

3. The pretests and posttests should be a principal source of information for the process evaluator. To provide an efficient means of accessibility to such information, data should be collected for each objective as indicated on the form "Summary of Test Information." (A copy is attached to these recommendations.)

4. To guard against the failure of the pretest and posttest complement of the instructional program, the following steps should be taken with respect to paper and pencil tests:

   (a) All paper and pencil pretests and posttests should be submitted for readability checks. No test should have a reading grade level higher than 6.0 unless the particular objective demands a higher level.

   (b) Alternate forms of tests need to be developed. An absolute minimum is 2 forms, and if at all possible, more than 2 forms should be developed. (At the least, an alternate form can be obtained by rearrangement of questions.)

   (c) The number of items on any test should be sufficiently large so that the probability of reaching the minimal competence level by chance is remote.

(d) For those pretests which are paper and pencil, while the posttest is of some other format, students should not be allowed to proficiency out of the objective until evidence is accumulated that results on the paper and pencil test are highly correlated with the criterion performance.

5. To provide for the surveillance of student progress as well as to provide information for the evaluation of the diagnostic procedure, data should be collected for each student as follows:

(a) Data prior to entry into the program
- Name
- Age
- Sex
- Stanford Achievement Scores--Grade 8
- W.I.S.C
- Scores on diagnostic tests
- Attitude
- Self-concept } IOX Instruments

(b) During Program (Design for a field size of 80 on a punch card for each objective.)

	Columns
Student I.D.	1 - 2
Objective I.D.	3 -11
Passing Score in Percent	12-14
Pretest Date	15-17
Pretest Score in Percent	18-20
First Posttest Date	21-23
First Posttest Score in Percent	24-26
First Posttest Learning Activities 1=yes 0=no	27-35
Second Posttest Date	36-38
Second Posttest Score in Percent	39-41
Second Posttest Learning Activities 1=yes 0=no	42-50
Third Posttest Date	51-53
Third Posttest Score in Percent	54-56
Third Posttest Learning Activities 1=yes 0=no	57-65
Fourth Posttest Date	66-68
Fourth Posttest Score in Percent	69-71
Fourth Posttest Learning Activities	72-80

(c) Data at completion of program
Stanford Achievement Test Scores
Attitude Posttest
Self-Concept Posttest IOX Instruments

(d) Other
Diagnostic decisions about the individual
Attitude and Self-concept tests administered during the program

6. A readability check should be made on the Stanford Achievement Test as well as a check for content validity. If the test is judged reasonably appropriate, then the test should be administered to the students in the project and to at least a sample of the remaining ninth graders at the conclusion of the project. This would provide for some type of external comparison.

7. Employ the structured interview technique initially for the parental attitude survey. From this information, an instrument could possibly be developed for future use.

8. The student attitude and self-concept report inventories (IOX) be considered as substitutes for the Kuder Personal Preference and the Gordon Personal Profile instruments.

9. Since the commitment has been made to report pupil progress in the format of A,B,C,D,F, the following guidelines are suggested:

(a) Minimum levels of acceptable performance on each objective should be specified. They should be set so that a student who meets that minimum level can have a reasonable expectation of success on future objectives.
(b) The performance level for A,B,C on each objective should be explicitly stated.
(c) A student should be permitted to recycle until he is satisfied with the level of performance achieved, and it is that final level which should be incorporated into the assignment of a letter mark.
(d) Policies need to be set concerning the quantity of work that needs to be successfully completed for a given letter mark, including the extent to which "questing" work will be considered.

Policies and Procedures for Testing, Scoring, Grading, and Data Recording

1. Testing--
   A. Tests, pre and post, (2 alternate forms of each) are to be prepared in advance for each objective package.
   B. Tests of a nature other than objective paper and pencil tests such as essay, demonstration or verbal, should list the objective criteria on which scoring will be based, such as essential points or concepts to be covered by the student. Such criteria should be developed in such a manner to allow for percentage scoring and stating minimum competency levels in terms of percentage scores.

2. Scoring--
   A. Raw scores on tests are to be converted into percentage scores.
   B. Test data is to be recorded in terms of percentage scores.
   C. Letter grades may be assigned for student reference but percentage scores are to be preserved for data collection and analysis.

3. Grading--
   A. Grades are to be assigned at nine week intervals and reported in regular grade report forms.
   B. Grading will focus primarily upon achieved competency levels of objectives completed.
   C. Grading will follow the scale established in the manual of policies and procedures of Lincoln High School as follows:

A	92 - 100%
B	85 - 91%
C	78 - 84%
D	70 - 77%
F	Below 69

   D. Grade data will consist primarily of the average or mean percentage score of the evaluative (post-test) scores of the objectives attempted by each student. If a student recycles the percentage score of the last post-test attempted will be used.

E. If a student is unable to achieve established competency criteria even after continued recycling, the teacher will decide if the student should discontinue work on that objective with non-completion.
F. Recycling will include directed alternate learning activities and individual tutoring as required.
G. If a student is not content to accept his post-test score as a grade for any objective, he may elect to pursue recycling or alternate learning activities with subsequent retesting in attempting to raise his competency level to his desired level or grade. If he is content to accept a marginally passing grade for any objective, that is his perogative.
H. Grades will be contingent to a degree upon maintaining reasonable progress through the course objectives in respect to the individual student's abilities and disabilities as determined by teacher assessment and judgment of initiative, effort, cooperation, etc.
I. Grading is to be criterion based and normative or group comparisons are not to be used in assigning grades.
J. If any evaluative tests seem to be either too simple or too difficult for the entire group or the majority of the students, see the P.E.D. for assistance in statistical manipulation or test revision procedures.

4. Data Recording and Storage--
A. After administering, scoring, and recording test data (both pre and post) return each test to the P.E.D. for storage for future analysis.
B. Keep records by student and by objective of the attached sheets and transmit to P.E.D. as directed.
C. Data recording and compiling is to be continual and constant as the data becomes available and is not to be neglected until report card time. Adequate program analysis will depend on accurate, prompt data collection, and recording procedures.

SUMMARY OF TEST INFORMATION
(by objective)

Objective_____ Subject Area_____
Cycle No._____

Student Name	Pretest			Posttest			Learning Activities Engaged In						
	*Date	Form	Score	Date	Form	Score	1	2	3	4	5	6	7

*The date should be entered as the number of the day beginning with Jan. 1 as 1. The numbers are to be 1 - 365.

SUMMARY OF TEST INFORMATION
(by student)

Student Name _____ Subject Area _____
Cycle No. _____

Objective Number	Pretest			Posttest			Learning Activities Engaged In						
	*Date	Form	Score	Date	Form	Score	1	2	3	4	5	6	7

*The date should be entered as the number of the day beginning with Jan. 1 as 1. The numbers are to be 1 - 365.

Program Staff

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MEDIA SPECIALIST

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Additional Publications

Program Publications List

Several additional program publications are being prepared for dissemination. Please consult with the Project Director as to the availability of these publications.

1. A Multi-Sensory Approach to Learning Disabilities: Program Survey

2. A Multi-Sensory Approach to Learning Disabilities: The Reading Program

3. A Multi-Sensory Approach to Learning Disabilities: The English Program

4. A Multi-Sensory Approach to Learning Disabilities: The Science Program

5. A Multi-Sensory Approach to Learning Disabilities: The Mathematics Program

6. A Multi-Sensory Approach to Learning Disabilities: The Assessment Program

7. A Multi-Sensory Approach to Learning Disabilities: Data Analysis

8. A Multi-Sensory Approach to Learning Disabilities: Project Proposal